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ABSTRACT

This manual for social studies teachers examines the current status of computer use in social studies classrooms, suggests reasons to use the computer, and discusses five ways computers can be used in social studies; i.e., as a method of delivering content, as a tool for retrieving and analyzing information, as an example of technology use in society, as a tool for developing thinking skills, and as a classroom management aid. Specific applications are then described, including drill and practice and four commercial simulations: "Sell Bicycles" (economics); "Geography Search: A Geography Simulation"; "Oregon: A Historical Simulation"; and "People Using Computers: Exploring Computing's Social Impact." Consideration is given to the effective integration of computers into instruction and the classroom management issues raised by computer use. Information is provided on sources of social studies computing materials, including software directories, software catalogs, commercial publishers, and professional journals. A discussion of computer materials evaluation covers instructional and computer-related criteria and criteria for product support. A final chapter considers the relationship of social studies computing activities (or products) to the school's overall instructional program. (LMM)

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Allen Glenn
University of Minnesota
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Ben Rawitsch
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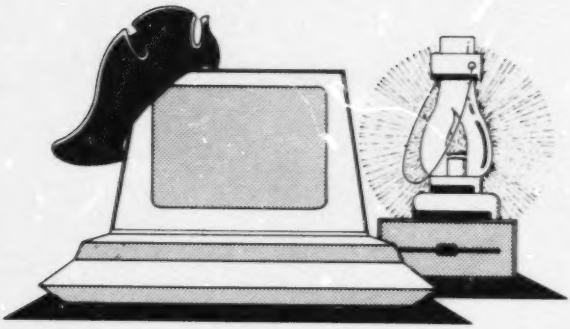
ABOUT THE AUTHORS

Allen Glenn is a Professor of Curriculum and Instruction in the College of Education, University of Minnesota, Minneapolis. He has been involved in social studies preservice and inservice training for many years and has been instrumental in incorporating instructional computing in the College's programs. He has served as consultant and developer to several instructional technology projects, including Computer Literacy Instructional Modules for the National Science Foundation, and Solutions Unlimited for the Agency For Instructional Television.

Don Rawitsch is Director of Services for the Minnesota Educational Computing Corporation (MECC). He is responsible for MECC's inservice training programs in instructional computing and the development of training materials. He is a licensed social studies teacher and has focused his graduate work on the use of computers in social studies. He has developed for MECC computer-based courseware and training materials in the social studies area.



Chapter 1: Introduction

On the 18th of April, 1775, Lt. Col. Francis Smith received secret orders from British General Thomas Gage to lead a force of 700 men to Concord to destroy the supplies the colonials had stored there. About ten o'clock that evening, Smith sent his troops to the edge of the Boston Common where they began embarking in boats for the short row across the Charles River to Cambridge. The Boston Committee of Safety, learning of their destination, sent Paul Revere and William Dawes to alert the countryside. Both men mounted their horses and galloped forth shouting, "The British are coming! The British are coming!"

The words of Revere and Dawes and the events that followed altered the lives of all who lived in the colonies. These two men were messengers of a change that was to bring excitement, joy, fear and frustration to all those who would be caught up in the revolution. No one's life would remain untouched. Even those who tried not to be a part were pulled into the events of the time. Lives were forever changed.

What do these events have to do with computers and social studies teachers? Why introduce a book on computers and social studies with a note about the Revolutionary War? There are three basic reasons.

First, social studies teachers, maybe more than other teachers in schools, have a sense of history. Because of their training, they understand change and how events influence the lives of people.

Lexington and Concord, Bunker Hill, Ticonderoga, and the Second Continental Congress were the major events of 1775 which continued to push the colonists toward independence. Social studies teachers have an understanding of the past and an appreciation for how these events shaped the future. Social studies teachers know the importance of preparing people to understand events that impact their lives.

Second, American society is currently going through another dramatic change that will shape its future and the lives of its people. Unlike the 1770s, the cause of the forthcoming change is not a physical force but a technological one, the computer. New messengers are suggesting that humankind has entered another watershed period in the evolution of thought, and educators must prepare themselves and their students to be computer literate if they are to continue to be effective, participating citizens. Change is occurring rapidly and everyone will be caught up in the events of the time.

Finally, people who lived in the colonies faced the impending confrontation with the British with mixed emotions. Some were filled with excitement and anticipation because they saw a great opportunity for themselves and people around them. The revolution was welcomed and brought new life to their existence. At the same time they were also filled with fear and concern. Could they succeed in this new nation? What if they didn't fit in or adapt? What if the idea didn't work? Along with those who anticipated change were those who opposed it. They were comfortable with the present and wanted things to remain the same. They became reluctant participants, but were still greatly influenced by the tide of events.

So it is today among social studies teachers. An increasing number are excited about the computer's potential as a teaching/learning tool. They have a certain amount of fear and nervousness about this powerful machine and their ability to learn new skills, especially when it appears to be so easy for the young! And, there are also those individuals who do not want to change. These people point to television and recall how other messengers said that television would revolutionize education. It has not, they suggest, and classrooms are still pretty much the same. So too, say these reluctant participants, will be the impact of computers! But, they misjudge the computer. With its interactive capabilities and general acceptance as an important tool, the computer and related technology will dramatically affect the lives of all teachers whether they want to be affected or not.

This book is for the social studies teacher who understands the need to appreciate the past and prepare for the future. It is written to provide advice about using computers in the classroom. It is hoped the book will lessen fears and potential frustrations by providing specific insights into instructional uses of computers and ways to manage a classroom in which computers are being used for instruction.

Computers and Social Studies: What's Happening?

More and more computers are available for use in today's schools. A recent survey found that those schools that have a computer usually have at least three available for instructional use and the average student uses one about 45 minutes per week.* In most schools there are two or three teachers who are *computer enthusiasts* and who lead the way in using computers and providing help that other teachers might need. With the increased number of computers, more commercial developers have entered the market and are supplying computer-based instructional materials for educational uses. Included in this group are large commercial publishing houses that have begun to develop computer materials to support textbooks, the mainstay of most curriculum areas. Projections suggest that many more computer-related products will be available by the late 1980s.

Computers are used in a variety of ways in schools. The dominant use is for teaching programming. Next comes use of various drill-and-practice exercises and educational games. More sophisticated applications such as simulations, word processing, and problem solving currently constitute only a small percentage of instructional computing activity. Therefore, although computer usage is increasing rapidly in schools, most of the usage remains outside the main activities normally found in a social studies classroom. Given these considerations, where does the social studies teacher stand in relation to the teachers in other content areas?

Currently, social studies teachers rank near the bottom of the list. Mathematics teachers, business teachers and, in some surveys, English teachers rank above the social studies teacher in the amount of time spent using computers in the classroom. Why are social studies teachers not using computers more? There are four general reasons.

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* Henry Becker, "School Uses of Microcomputers," Center for Social Organization of Schools, Johns Hopkins University, Issue No. 1, April 1983.

- **Computers have not historically belonged to the social studies program area.** When computers are first introduced into the school, the mathematics area usually receives them. This physical location determines who uses the computers. If a social studies teacher wants to use them, negotiations with the math instructor are often necessary and, in many cases, students must be moved to another room.
- **For many computer educators of the 1970s, programming was thought to be the best use of computers for students.** To use the computer, a teacher had to be knowledgeable about programming. Once again the math instructor was often the most interested teacher and would teach the programming course in the school. A few social studies teachers became good programmers, but the majority were not interested.
- **There is a limited variety of computer software in the area of social studies.** Most of what was first available focused on simulations and data analysis/problem solving. Early advocates of computer use in social studies therefore encouraged teachers to use these materials in their classrooms. However, many of the early computer simulations were difficult to use and applied to only a few content areas. As a consequence, computer simulations were not often used. Data-analysis and problem-solving computer materials are also time-consuming activities and require teaching stategies that are not widely used by many classroom teachers.
- **Social studies is not often the focus of inservice education, and available training is not designed to fit the needs of social studies teachers.** Lack of materials and a belief that other areas are more important have led to a limited number of training sessions. As a consequence, computers have not played an important role in social studies instruction for most teachers.

With the introduction of inexpensive microcomputers and their rapidly increasing availability in the schools, more materials are being developed for the social studies classroom. Social studies teachers who are interested in using these materials can now bring the computer into the classroom with minimal effort. Some have begun to see the computer's potential. What is this potential? Why should a social studies teacher become interested in computer use?

Why Use the Computer?

New technologies have always been introduced with great fanfare and promise. Accompanied by claims about their educational

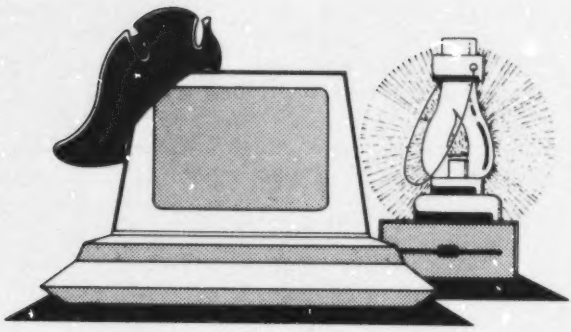
potential, computers have been no different. Advocates suggested that computers could solve most of the educational problems facing teachers. Overzealous converts to computer education predicted that students would soon be using computers to learn and would not need teachers. In reality, the movement of computers into the classroom has been steady but slow, and classrooms in 1984 are much like they were in the past. But changes are coming more rapidly. It is becoming evident that computers will play an important role in the education of young people and that the teacher's role will change. So, why use the computer?

The question is best answered by looking at two general areas. The first relates to the broader social studies curriculum and the second to an issue of instruction. Good social studies teachers work continually to keep current in these two areas in order to do their jobs better.

The social studies curriculum has as a major goal the preparation of students for effective participation in society. This preparation includes the knowledge, skills and attitudes that allow students to meet the challenges of the future. A viable social studies classroom therefore needs to incorporate not only events of the past but also those events that are happening now that will shape the future. Social studies teachers should be aware of the computer and teach students about its impact because it is one of the most important technological forces of the 20th century. It is having and will continue to have a tremendous impact on society, and it must be a part of the social studies curriculum.

The social studies curriculum is based upon the facts, concepts, generalizations and skills of the social sciences. Use of computers has changed the manner in which social scientists study societies. Use of computers in the behavioral sciences has permitted scholars to study individual attitudes and factors that influence behavior. Social studies teachers need to introduce their students to the computer as it relates to social science disciplines and instruct them in how the computer can be used to study basic social science questions.

Such philosophical arguments cannot be the sole reason for having social studies teachers use computers in the classroom. The most important reason is that the computer can assist the teacher in meeting goals of the social studies curriculum and daily challenges of teaching young people. It is a versatile tool that will help social studies teachers do their jobs better. The next chapter examines five specific ways in which computers can be used.



Chapter 2: How Can Computers Be Used in Social Studies?

Computers can benefit the teaching of social studies in a wide variety of ways. The computer can be used as:

- a method of delivering content
- a tool for retrieving and analyzing information
- an example of technology use in society
- a tool for developing thinking skills
- a classroom management aid

By understanding each of these roles, teachers will gain a better understanding of the potential of computers.

Using the Computer to Deliver Content

Using computers as a tool for delivering content material to students is the most obvious application of this technology to the social studies. Past technologies such as movies, tape recorders, filmstrips and phonograph records have already been used for this purpose. In fact, one could even consider books as a technology of this nature.

Types of activities for delivering content include *tutorial*, in which new information is imparted; *drill*, in which knowledge of previously imparted information is tested; and *simulation*, in which students learn by experiencing a model of a real-life situation. These activities are common in social studies teaching and all apply to computer use.

Consider map reading skills as the subject of a computer tutorial. A paragraph on the screen explains a particular skill such as determining longitude and latitude. Then a graphic display, perhaps including animated motion, demonstrates locating a place using longitude and latitude readings.

Carrying this to the drill stage, the student is then asked to try two exercises. First, several places are shown on a map, and degree readings for each are to be entered. Second, the student is given degree readings and asked to locate them on a map by using selected computer buttons to move two *cross hairs*, one vertical and one horizontal. When these lines have pinpointed the location, the student presses another button and the computer determines the accuracy of the answer. A built-in checking feature keeps a record of student scores, so the teacher can later determine each student's progress.

Computers have been particularly advantageous in presenting simulations. Effective simulations are based on complicated arithmetic models. The computer can carry out the arithmetic effortlessly so that the simulation participants can concentrate on the concepts of the activity.

There are two types of computer simulations. A role play simulation has the student play the role of a particular type of person in the simulated experience. For example, a simulation of crossing the Atlantic Ocean in the sixteenth century would ask students to put themselves in the place of a European explorer facing the hardships of a long voyage in primitive vessels. A simulation which involves manipulating societal factors has students step *outside* of human roles to control whole environments. For example, a simulation of the U.S. economy could ask students to change income, consumption or production to see what effect various factors have on the country. These types of simulations existed before computers entered the classroom. Computers allow some of them to be more easily and effectively implemented.

Using the Computer to Retrieve and Analyze Information

Most people associate computers with calculating, and many teachers have used computers in college work to analyze research data. These capabilities are also useful in the social studies classroom. Computers can tally numerical amounts, as in analysis of a simple opinion survey. Students can collect data by asking friends or family members opinion questions while noting characteristics such as the sex and age of each respondent. This information from all respondents is then typed into a computer using an appropriate software package. The computer performs the

necessary calculations to determine group response to each opinion item and to examine personal characteristics of people with the same opinion on an item. For example, a political survey might find first that most people favor Candidate A over Candidate B, and second that Candidate A is favored by more men than women, and by more younger than older people.

Computers can select information based on chosen characteristics. For example, a data collection for all countries can be created showing information such as location, type of political and economic system, etc. Students can then use the computer to investigate questions such as "Are there common characteristics among countries that have representative-type governments, or among those that have dictatorial governments?" The student can direct the computer to list all countries having both a representative governmental system and those having a "free market" economy, or perhaps countries having dictatorial governments and controlled economies. The resulting information can lead the student to investigate information that would not have been apparent without the data analysis.

Information retrieval will play an increasingly important role in society's use of computers. Commercial ventures are already providing access to data bases for business, educational and home use. Such commercial information utilities allow users to peruse on-line newspapers, stock market data, and special-purpose electronic bulletin boards. They also provide a method of personal communication via computerized *mail* services. A school that subscribes to such a service can open up to its students a large volume of information otherwise difficult to access. Social studies teachers can use the information as the focus of current events activities or to study key social factors such as the economy. Students need library skills in order to retrieve information from print and non-print media; likewise, data retrieval and analysis skills are critical as more information is stored and made accessible electronically.

Computers can also be used to predict events from past data by using an arithmetic model. For example, a model of population growth can be implemented on the computer. Students can then change certain variables, such as birth rate or average age of giving birth, to see what the effect will be on the population several years into the future. Perhaps some of these changes will result in slowing down the over-population problem in the world. This leads to discussion of what social policies are needed to implement recommended changes and whether such policies are indeed practical.

One mission of the social studies classroom is to show students how social scientists work to add to our knowledge. Social science today relies significantly on analysis of data, often using the computer. These applications, geared to an appropriate level, form the basis of valuable social studies activities.

Using the Computer as an Example of Technology Use in Society

The social studies endeavor to help students understand the world. In a world increasingly dependent on technology, an understanding of the social implications of technology becomes more important. Computers are at the heart of this new information technology. Having computers available facilitates teaching students about the technology that will influence their lives.

The very existence of computers in schools can be viewed as a metaphor for technology in society. Social studies activities can be built around discussion of the impact of computers on students' school life and whether similar impacts will be experienced beyond school. Students might compare school in their parents' time with school today and discuss how technology has contributed to the changes.

Computers are being used in all aspects of our society. While students can read about these uses in books, it is more effective if they can be experienced, at least in simulated form, using school computers. Computer simulations of computer applications in retailing, medicine, politics, communications, finance and other areas can help students better understand the computer's impact. The computer's impact on the formation of a global society fits well with the global studies component of many curricula.

The use of computer technology raises various social issues. Automation is eliminating some jobs and creating other new ones. This can create problems for a society. What effect will the resulting pool of unemployed people have on the economy and social institutions? How can these people be retrained for other jobs and who has the responsibility to do it? Who will fill the new types of jobs created, especially since they are likely to require new types of skills? How should the educational system respond in preparing students for an economy in which jobs are constantly changing?

Personal data is being stored on computers by the government and credit companies. Who decides what information is collected? Who verifies its accuracy? How can a citizen know what informa-

tion is stored about him/her? What are the possible damages caused to an individual as a result of personal information being incorrect or misinterpreted? Who can view the personal information kept on an individual?

Computer-related crime costs consumers huge amounts of money and is rarely detected. Companies often fail to maintain adequate security for their computer installations and the information stored there. Many times crimes are perpetrated by company employees whose activities go undetected due to the complexity of computer procedures. Computer criminals often fail to see the unlawfulness of their acts, feeling that if access to computer resources is left unguarded, it is legitimate to take advantage of it. Companies that do uncover criminal activity are hesitant to report it, fearing the negative publicity that will result. These factors contribute to the rapid growth of this technology-related problem.

Issues such as these can provide the basis for important classroom discussions. They can also be exemplified in simulated activities. Students can experience holding a job dependent on computer work, running a credit check on a classmate, or committing computerized embezzlement of company funds (admittedly a controversial activity).

A significant plus for computer-based activities in general is that they can be much more participatory for students than other methods of learning. An ideal way to take advantage of this characteristic is in teaching about the impact of technology itself. And exploration of social impact is well within the domain of the social studies.

Using the Computer to Develop Thinking Skills

Most subject areas include the development of students' thinking skills as an underlying goal. Logic and problem solving, and the ability to think creatively apply to social studies learning, and computer activities can contribute to the development of these skills.

Problem solving in social studies usually denotes the skill of interpreting information to make logical and effective decisions. Making decisions is at the heart of simulation activities such as those implemented on computers. In a simulation, the student is presented with a situation in which a problem exists or a goal is to be achieved. The student is given resources to assist in reaching the goal, a timeline of sorts, and rules of behavior. Reaching the goal within the limits of the resources and the

bounds of the rules requires thinking skills. Many simulations add the aspect of group play, causing students to make their decisions in an environment of group dynamics. The next chapter describes three simulations that challenge students to run a company, find a sea route to an unexplored land, and cross a wilderness by covered wagon.

Simulations are based on models that try to approximate reality. Because these models often involve a series of arithmetic calculations, computers are helpful tools for presenting the activity. Use of a simulation can be enhanced if the teacher goes beyond discussing the simulated events to discussing the actual simulation model. Students could first be challenged to try to piece the model together based on observations of results from various decisions. The student might decide to run through the simulation on the computer several times using specific decision patterns and recording results. What made money values rise and fall? What increased or decreased speed of travel? What generated more or less political influence for a group? A rough outline of the model could be deduced from answering such questions.

After this kind of practice, students might attempt to describe models of their own for how certain social phenomena behave. For example, what is the relationship between interest rates and the stock market?—between the economy and a president's popularity?—between employment levels and social unrest? Students can experiment in describing these admittedly imprecise relationships using simple arithmetic formulas. Students with a fundamental knowledge of computer programming might actually write small programs for the computer using these formulas.

Computer activities such as simulations relate to certain social studies content. Examining the workings of a simulation while using it to study content can form the basis of problem-solving activities as well.

Using the Computer to Aid in Management Tasks

In addition to directly enhancing the instructional process, the computer can help indirectly by simplifying a teacher's non-instructional tasks. For example, the teacher can use the computer as a word processor to prepare classroom materials. These materials can be printed, stored for later use, and easily modified using the computer. Specific computer software is used to generate special materials such as vocabulary exercises in the form of crossword or word-find puzzles. The teacher merely types in the words to be used. The computer formats the puzzle for printing

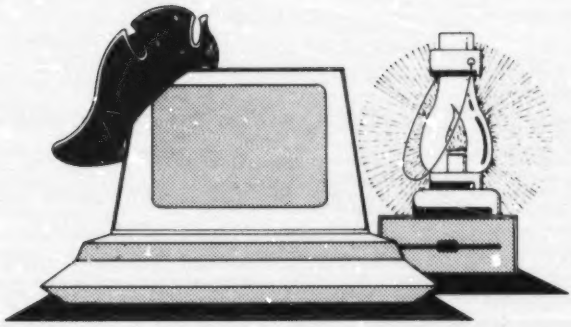
and duplication. Not only do these applications save teacher time, but in so doing they encourage teachers to use a greater variety of materials, to use originally created materials, and to modify materials for different classroom situations.

Testing is another area in which computers save time. The teacher can store a bank of test items on the computer and have it create a test based on particular teacher-selected objectives. The computer can create different versions of the same test by randomly selecting the choice and order of test items. The computer can be used to print written versions of a test or to present the test directly to a student using the computer. In the latter case, the student's score can be calculated and recorded instantly.

Different types of record keeping can be accomplished using the computer. When test scoring is linked to the computer, both teacher and student can quickly obtain periodic reports on student progress in meeting specific learning objectives. The teacher can use this data to diagnose problem areas and prescribe further activities geared to student needs. The computer can also be used to calculate and record final grade information. The computer can also take over the drudgery of the arithmetic for teachers who assign letter grades based on percentage calculations or curve distributions.

In performing management tasks as described above, the computer helps alleviate the teacher's routine paper work. This can help make the teacher's day more pleasant, and it can free teachers to spend more time interacting with students. Using some of these management aids is a good way to start exploring computer use.

The types of computer activities described in this chapter define the scope of social studies computer use. Teachers who have not yet made extensive use of the computer will benefit from the next chapter which details some specific classroom applications.



Chapter 3: What Are Some Specific Computer Applications for Student Use?

The best way to discover what computer applications for social studies look like and how they work is to try some for yourself. Spending some time at the computer and reading accompanying support materials is a must. A few selected applications are described here for teachers with a limited amount of computer experience.

You will notice that these examples are mostly simulations. Simulation activities constitute most of the best computer applications developed to date. These simulations are involved enough to offer variety in classroom activity and to demonstrate useful capabilities of the computer. Because of this, however, they usually require thorough preparation on the part of the teacher. At the end of the book, suggestions will be offered as to what other kinds of computer applications are needed in the social studies area.

Drill and Practice

Drill-and-practice applications in social studies have been created to cover factual areas such as map identification of cities, states and countries; identification of U.S. presidents; and dating of historical events. Using a geography quiz as an example, the computer asks the student what type of information is to be quizzed: state capitals, nation capitals, country locations, or physical feature locations. After that choice is made, the student enters

the number of quiz items to be presented. Questions are given one at a time in multiple choice or identification format. In some cases a map is shown on the computer's screen as part of the question. The student is given two chances to respond correctly to each question. A correct answer produces a complimentary message from the computer. When items are not correctly answered in two attempts, correct answers are reviewed for the student. These items are then repeated later in the sequence as reinforcement. When the exercise is over, the computer informs the student of the number of items answered correctly on the first and second attempts, and the number incorrect. Some drills have added features such as tabulating individual student scores and recommending information that should be reviewed further.

This activity could take 10-15 minutes, allowing several students to participate during one class period. Although drill activities are virtually self-explanatory, the software package might also include teacher support materials containing companion worksheets for computer work.

While drill might not be the most imaginative way to use computers, this kind of application can be useful. It frees the teacher from conducting the activity directly, allowing more time to work with individual students. Students can engage in the type and amount of drill work they need, and can work at their own pace. The computer offers a tool for remediation for students who lack the necessary background to handle new material. The record-keeping component of drill applications provides the teacher with a convenient record of individual student progress. In addition, class-wide patterns are indicated, showing which facts and concepts require further group instruction from the teacher.

Sell Bicycles: An Economics Simulation*

You are the manager of a bicycle manufacturing company which is in close competition with its competitors. At the beginning of each fiscal quarter, you must meet with your partners to make decisions which will guide the company's fortunes. What level of production? How much to charge customers? What kind of advertising campaign to mount? The company's profits depend on the judgments of your group. Shrewd management brings success. Ineffective management brings losses or even bankruptcy. Risks are great and stakes are high!

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* *Sell Bicycles* on *Elementary Volume 3*, The Minnesota Educational Computing Corporation (MECC), 3490 Lexington Avenue North, St. Paul, MN 55112.

An important aspect of the study of economics is the *micro* view, that is, how individual organizations cope with the economic forces that surround them. Businesses are frequently the focus of study and the *Sell Bicycles* simulation allows students to learn how a business is run by actually doing it in a simulated setting. To begin, students are divided into two teams, each with three or four players. Several pairs of teams can be set up to allow all students in the class to participate at once. Each pair of teams represents two competing companies. The objectives for the activity include 1) understanding economic terms such as supply, demand, assets, inventory and profit; 2) understanding how supply and demand are affected by production, pricing and advertising; and 3) determining successful marketing strategies in an environment of business competition.

Each of the two competing companies starts with $5000 and 100 bicycles in inventory. It costs $20 to produce a bicycle. In each round of the simulation, each company must decide how many bicycles to make, the price to be charged for a bicycle, and the amount of money to be spent on advertising the product. The model used in the simulation assumes that the decisions of one company affect the other company.

As a round begins, students in each company meet privately. They discuss decisions to be made and record their conclusions on paper. When both teams are finished, they go to the computer and type in data representing their decisions. The computer uses this data to perform calculations based on the mathematical model of this miniature economy of only two companies. The computer then reports for each company the number of bicycles sold, profits generated, cash left, bicycles left in inventory, and the remaining level of assets. Armed with this information, the teams retire for the next round of decision making.

The immediate goal of the game is to reach $12,000 in assets. This might take 8-12 rounds of play over several days. After the fourth round random events such as labor strikes, factory fires, or wage/price freezes begin to happen, making the simulation experience more realistic. The accompanying support materials include worksheets on which students record the progress of their company. Supplementary exercises are also included, which ask students to carry out some of the calculations of the model and to explain why particular strategies are effective in given circumstances.

The simulation provides students with the opportunity to put their knowledge of elementary business economics to work while learning to work together in a group to solve problems.

Geography Search: A Geography Simulation*

You are captain of a sailing ship several centuries ago before the New World was fully explored. You and your crew have been challenged by the queen of your country to sail to a distant, little known land where, according to legend, there is a bounty in gold. The location of this new land is not well charted, and you must rely primarily on your navigation skills to make the journey. Sophisticated equipment has not yet been developed, so navigation is based on knowledge of wind direction, temperature, water depth, position of the stars overhead, and reading a sun dial. Sail intelligently and you will reach your goal safely, returning with riches for your patron. Blunder and you might well find yourself stranded in uncharted areas faced with starvation as supplies run low!

Geography Search is a simulation of leading an ocean expedition in a bygone era. Students work in teams of four or five to make decisions on how the ship should be navigated. When several teams are participating at once, the goal is to return home with riches in the shortest time possible. The queen will reward the first team back with the highest price for the gold. Learning objectives for this activity include 1) understanding various geographic terms such as longitude, latitude, trade winds and navigation; 2) understanding navigational techniques based on star position, sun position, water depth and weather; and 3) appreciating the hardships encountered by the ocean explorers of the sixteenth and seventeenth centuries.

The simulation is organized into rounds during which each ship's crew meets privately to make navigational decisions. One by one each team enters their decisions into the computer and observes the results. The teams do not have to view the computer screen simultaneously because reports to each ship include a reading on the position of the others. A team must decide each time whether to sail ahead, sail along the shoreline of a landmass if one has been encountered, or go ashore if near land. When under sail, a direction and a duration for continuing on that course must be chosen, based on wind conditions. The location of the ship must be determined by students based on data presented both numerically and graphically on cloud conditions, wind direction and speed, temperature, water level, star position,

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* *Geography Search*, McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020.

clock reading, and remaining inventory of provisions. Students record this data on sheets and plot their position on a mapping grid, all provided with the support materials.

The simulation lasts 8-12 rounds played over several days. The teams eventually reach land, find gold and load their ships. Then comes the toughest decision of all. Having traveled west from their homeland, they must decide whether to return by sailing in the opposite direction, or risk continuing west in hopes that the earth is indeed round!

Students learn about geography as well as history through this activity. They also experience the uncertainty of exploration and learn about group decision making in situations where the answers are uncertain.

Oregon: A Historical Simulation*

It is 1847. You and your family are setting out for a new home beyond the settled portion of the United States. You are intent on following a wagon train to the Oregon Territory, riding for five to six months over the plains, deserts and mountains of the 2,000-mile Oregon Trail. You stock up on provisions to begin the journey and save some cash for buying more provisions at forts along the way. As you journey, each week proves eventful. Heavy rains, large rivers to ford, wagon breakdowns, illness and attacks by looters are commonplace. You must make good time. If caught in the western mountains too late in the year, you will freeze in the blizzards. Wise decisions will enable you to reach your goal before supplies run out; otherwise, you become one of many early settlers who perished in search of a promised land to the west.

Oregon is also a simulation of an historical journey. This time, however, there is no team competition. The student family of four or five is strictly battling the elements. Each turn is a two-week period on the trail. Decisions must be made on whether to hunt, stop at forts or forge ahead. When hunting with a rifle, students are presented with game animals moving across the screen. Certain keys on the keyboard are used to fire on the animals. This is far more than a game, however. Hunting slows you down, and failure decreases your food supply. Though provisions can be supplemented at forts, they cost significantly more because of the forts' distance from supply centers.

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* *Oregon* on *Elementary Volume 6*, MECC, 3490 Lexington Avenue North, St. Paul, MN 55112.

Calamities are common and usually reduce progress made in mileage as well as supply levels. As this occurs, stopping to replenish supplies becomes an even more difficult decision because of the time factor. The family may die from starvation or may suffer illness from eating poorly or lack of medicine. The computer determines outcomes of student decisions by using a mathematical model that takes into account the probability of certain events happening at certain points along the trail. These probabilities were estimated through research using diaries of settlers that actually traveled the Oregon Trail.

The teacher can increase the value of the *Oregon* activity by having students also engage in mapmaking, reading settlers' diaries and researching related topics. Use of computers provides an excellent opportunity to discuss with students where we get our images of reality. The simulation should be compared to film, television, textbook and primary source versions of what life during this period was like. As the activity progresses, students also tend to develop concepts on their own such as division of labor and democratic decision making. These social skills add to the potential of the simulation as a broad-based learning activity.

Oregon is most obviously a lesson in U.S. history. Yet, like *Geography Search*, it might form the basis for concept units on immigration/emigration (compare it to the 1880-1920 European flow to the U.S.) or exploration of the unknown (compare the wagon train to Columbus' vessels or today's space shuttle).

People Using Computers: Exploring Computing's Social Impact*

You are a bank teller in the middle of a busy day. A long line of customers is stretched out in front of your window. Suddenly the screen of your computer terminal goes blank. The computer has broken down. You wonder if this is what they mean by computers making our jobs better . . .

You are a newspaper typesetter. Your manual skills help get the paper laid out and printed each day. One day the paper begins use of a computerized printing system. What happened to your job security? . . .

You apply for a car loan. The loan company checks your computerized credit file and finds you have an unsatisfactory history of paying your bills. The loan is denied. But you find out later that the computer file was out of date and incorrect. Is this how computers improve our way of living? . . .

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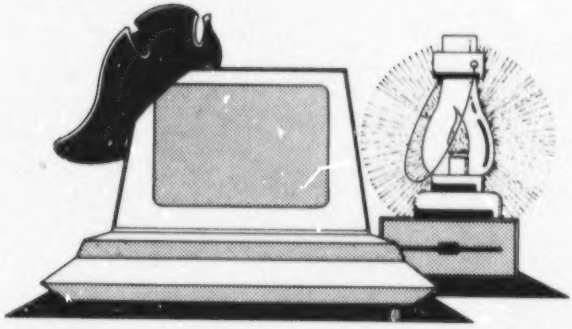
* *People Using Computers: Exploring Computing's Social Impact*, Scott, Foresman and Company, 1900 East Lake Avenue, Glenview, Illinois, 60025.

People Using Computers is a series of activities designed to introduce students to ways computers are used in society and issues raised by this use. In addition to reading about these topics, students actually experience simulated computer uses to understand them better. The product is more than a set of computer programs with teacher materials — students also use a workbook to guide them through the activities.

Typically, each of the fourteen lessons contains a series of steps. The student first reads a page or two of background in the workbook. A second workbook section prepares the student for the computer hands-on activity. Then the student goes to the computer with the workbook. The book guides the student through the activity, asking questions along the way. Finally, the student answers a set of review questions in the workbook.

The emphasis here is not on how computers work. Instead, students explore why certain attributes like speed and accuracy make computers useful in real-life situations. One lesson emphasizes that computers cannot do everything by presenting a computer program that attempts to help students choose friends. How computers are changing jobs and the way people view their jobs is discussed through simulated banking, newspaper and telephone activities. Finally, issues related to the undesirable effects of technology are covered. Do computers make mistakes or is it the fault of people using them? How is computer information misused and how do computers create an environment that encourages new types of criminal activity? What will happen to community interaction if people do all their shopping and other personal business from their homes via computer?

Social studies is a logical place to teach about the social impact of computing, and this product provides the materials, both in text format and by using computer activities to exemplify the concepts presented.



Chapter 4: What Needs To Be Considered in Using Computers for Instruction?

As shown in the preceding chapters, computer applications can provide teachers with a variety of ways to use computers, either as teaching/learning tools or as utility tools for materials preparation and record keeping. Realizing that there are different uses of computers, however, is just the beginning. In this chapter, two other important questions will be considered: 1) How can computers be integrated effectively into instruction? and 2) What classroom management issues are raised by computer use? By considering these two additional questions, teachers will be better prepared to use computers effectively.

Integrating the Computer Into Instruction

The major instructional goal for social studies teachers is to design a series of activities that teach students the content and skills of the course. In order to reach this goal, a variety of lessons and strategies are used. Computers can be used as another tool in this instructional sequence, but they must be used properly if they are to assist students in achieving specified learning outcomes. Poor instruction with computers is still poor instruction.

Research on effective teaching has shown that there are certain basic principles that lead to higher learning in the classroom.

To use a computer as an effective instructional tool means that some of these same basic principles must be considered. Four of these principles seem particularly appropriate.*

Principle 1: Students Learn Differently.

It is obvious to any experienced teacher that some students need extra time and concrete examples in order to understand a concept. Others are capable of reading materials and understanding the basic ideas discussed. Still others need additional practice in order to remember the content. Effective instruction provides a variety of learning activities in order to meet the needs of a diverse group of students.

It is important to remember this principle when planning to use computers for instruction. Not all students will learn by using the same computer application. For example, drill-and- practice exercises may be useful to some students but boring to others. In order to learn from a simulation or data base activity, many students may need careful instruction prior to using the computer. And some students may not enjoy using the computer at all. Computer applications must be varied just like any other instructional activity if the needs of all students are to be met.

Principle 2: Instruction Must Provide an Opportunity for Students to Practice.

Any good coach knows that practice prior to a game is crucial. The same principle holds true in the classroom. Students need to practice using their knowledge if they are to retain it and use it in the real world. Exercises must be developed in which students apply prior knowledge to new but similar situations. The goal is to have students practice applying their knowledge so that they can describe and explain what is happening in the world around them.

Selected computer courseware can provide patient, careful practice to help students learn social studies content and skills.

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* The body of research related to effective teaching has grown considerably in the past few years. The four principles presented here are drawn from that research. The following sources are of particular value:

Penelope Peterson and Herbert Walberg (eds.), *Research On Teaching: Concepts, Findings and Implications* (Berkeley: McCutchan Publishing Corp., 1979). See Chapter 1, "The Effectiveness of Teachers" by Donald Medley, pp. 11-27.

Benjamin Bloom, *Human Characteristics And School Learning* (New York: McGraw-Hill Book Company, 1982).

Thomas Good, Bruce Biddle and Jere Brophy, *Teachers Make a Difference* (New York: Holt, Rinehart and Winston, 1975).

When properly used, drill-and-practice exercises can assist students and free the teacher for other instructional activities. Simulations can provide opportunities for students to practice using their knowledge.

Principle 3: Increasing Students' Time-on-task Increases Learning.

Time-on-task means that students spend their time efficiently in studying the topic. A goal of effective teaching is to develop a classroom environment in which students use their time for learning. Included in this goal is the creation of lessons that are directly related to learning outcomes and that focus student learning on key issues.

Computer courseware can be designed to focus student attention on the task and to guide learners through the instructional activity. Because computer use can reduce the number of distractions to the student, material can be learned at a faster, more concentrated pace.* Materials need to be selected that focus on important topics related to the learning goals.

Principle 4: Effective Instruction Includes a Series of Lessons Integrated Into a Whole.

When thinking about instruction, most teachers think about units. A unit may be a few days or several weeks in length. The key to effective instruction is the integration of various instructional activities into a whole. Effective teachers build units like puzzles. Each activity is a piece of the puzzle, and when all the pieces are put together, they form a picture — colonial America, the Congress, or life in the 1960s. No one activity presents the whole picture — each makes a significant contribution.

When integrating computers into this puzzle, teachers need to consider learning outcomes, lessons that precede the computer activity, and methods for linking the computer application to the next set of activities. Computer applications seldom do all the necessary teaching. It is the role of the teacher to plan the total sequence and to assist students in pulling together the whole learning experience.

With these four principles of effective teaching as guideposts, it is possible to examine how computers may be used in three

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* James A. Kulik, Robert L. Bangert and George W. Williams, "Effects of Computer-Based Teaching On Secondary School Students," *Journal of Educational Psychology*, Vol. 75, No. 1, 1983, p. 24.

types of lessons that are most common in the social studies classroom. Each lesson is designed for a specific purpose.

Springboard Lessons

A major instructional task is to gain students' attention, focus that attention on key topics, and stimulate students to speculate about important relationships among variables. The purpose of a springboard lesson is not to teach specific content but to introduce it and get students thinking. Materials used in this lesson are open-ended, short in length, and designed to stimulate discussion. The role of the teacher is to elicit student responses and help build links with lessons that follow.

Selected computer applications can be used very effectively as springboard activities. *Sell Bicycles* is an excellent example. It can be played in a short time period, the rules are straightforward and simple, it is fun to play, and it raises issues that introduce students to three important economic concepts. Through participation in the simulation, students are introduced to how these three factors interact in a simple economic model. More importantly, the simulation provides a platform for additional study of basic issues.

Computer materials used as springboard activities should:

- introduce the topic with a minimum of explanation so that students can begin quickly;
- be based on a simple model that introduces a few basic variables; and
- be completed in a short time period.

The role of the teacher while using this type of computer activity is to assist students and guide discussion in which students raise issues for additional study.

Knowledge and Skill Development Lessons

These lessons are designed to teach students new content or skills. In the typical social studies classroom, textbooks, supplementary readings, films, lectures and worksheets are commonly used to convey the content and skills of a particular unit to students. Computer applications such as those described in Chapter 2 are also appropriate for this type of lesson. Drill-and-practice exercises, tutorials, simulations and problem-solving applications may all be used.

Consider the following questions when choosing a potential computer application for the teaching of content:

- Does the computer application meet the desired learning outcome(s)?
- Does the application teach the desired content as well as other means of instruction?
- What additional instructional activities would be necessary in order to use the materials effectively?
- What non-computer materials such as readings and charts/maps are needed to complete the materials?
- What kind of follow-up activities will be necessary in order to provide a complete learning experience?
- Is the content covered accurately?

It is important to remember that these activities fit into a total instructional sequence and in most cases do not stand alone.

Application Lesson

Application lessons are designed to have students apply what they have learned to new but similar situations. The purpose of these lessons is *not* to teach new content but to determine if students have learned what has been previously taught.

Computer applications can be used very effectively to determine whether or not students can apply their knowledge. For example, a teacher might use *Sell Bicycles* (or a similar activity) once again to determine if students learned about basic economic issues related to running their bicycle companies. If the material was learned, students should be able to make more reasoned decisions and be able to explain their actions.

Consider four key questions when choosing computer materials for application lessons:

- Does the objective of the computer activity match those of the preceding instructional activities?
- Does the activity provide opportunities for students to observe the direct correlation between what they have been learning and what they are being asked to do in the computer activity?
- Are questions available for drawing the activity to a close, and do they help students understand real world relationships?
- What instructional activities are needed to link this activity to the next set?

The answers to these questions will help teachers to determine whether the activity can reflect student learning.

Classroom Management Issues

In addition to determining and teaching content, teachers spend a lot of time managing students. When selecting instructional activities, it is important for many teachers to know whether or not they can maintain control of their class during the activity. Simulations, for example, may not be used by some teachers because of the student movement and potential confusion that may accompany them. Using a computer application means considering issues that relate to control and to the operation of equipment that may be unfamiliar to teachers and students. Considering the nature of the computer activity and the number of computers available can help alleviate some of these problems.

Computer applications vary greatly. Content, instructional strategy and overall quality may differ markedly from one application to another. They also differ in two important aspects that relate to classroom management. First, some computer applications may be loaded into the computer's memory all at once while others are loaded one part at a time. Second, some computer applications require the student to interact continually with the program while others may be stopped and started at different points.

Most of the computer activities used in today's classrooms are stored on diskettes that may contain several computer activities or "programs." Some programs are small enough that they may be loaded entirely at one time, the diskette removed from the computer, and the program then loaded into another computer. (Note: In purchasing a piece of software, you may be agreeing to a licensing arrangement which prohibits such *serial* use. If the program is too large to be loaded at one time, the diskette must remain in the computer. Therefore, if more than one computer is to be used for an activity, a copy of the program will be needed for each computer. A teacher should check prior to using a product whether one diskette or several will be needed. This information can be used to determine how many computers are needed and thus the number of students or groups of students that can use the activity in a set period of time.

The second consideration related to the type of computer application focuses on whether or not the computer program may be stopped and restarted again. Computer programs such as drill-and-practice exercises, educational games, tutorials and some simulations require that the student continually interact with the program. For example, a drill-and-practice exercise on

states and capitals may require the student to sit at the computer until finished. A premature exit might cause the computer to lose information about his/her progress.

Another type of computer application allows the computer program to be stopped and started without losing information or allows for the addition of past information when starting again. In such programs the computer receives data on student decisions and then provides feedback concerning the consequences. Many groups of students may plug in and out of the program at different times. Thus, a single computer can serve the needs of many students. An excellent example of this type of computer application is the simulation *Geography Search*. The computer program serves as a data collection for student "ships" navigating uncharted waters to the new world. The program will accommodate six different groups of students and, in fact, tells each group when to come to the computer to enter decisions. One computer serves at least six different groups, thereby lessening the problems of students waiting until one group is entirely finished before they can use the computer.

If the type of computer program is known, the teacher can make better decisions about the arangement of the classroom during instruction. If a program requires students to be at the computer all the time and if there is only one computer available, the teacher has several options. A learning station may be set up in the room, and students may use the computer at selected times. For example, a drill-and-practice exercise on various geographic features might be set up in the back of the room, with students assigned specific time slots for using the program. Or, students might use the program during study time and simply sign their name to a check sheet when they have completed the exercise. In this situation the computer program would supplement regular classroom activities. A similar arrangement could be used for tutorials and educational games.

It is possible to use highly interactive programs with both large and small groups. If the program is used as a large group presentation, the teacher can run the program and simply ask students to respond to questions on the screen. In such a case at least one large video monitor is needed to ensure that all students can read the print on the screen. While the main drawback is the lack of student involvement in the learning process, it is a means of using the computer's capacity in a learning activity.

If small groups use a continuous interaction program, it requires careful attention to classroom management. While one group of students is at the computer, at least four or five other groups must be involved with another related task. It is unrealistic to ask 25 students to sit quietly and wait their turn! In this case, support documentation must be available to provide students with seatwork activities that are meaningful and related to the problem that will be studied on the computer. Coordinating the on- and off-computer activities takes considerable effort; it is necessary to pull together all the various parts into a final discussion.

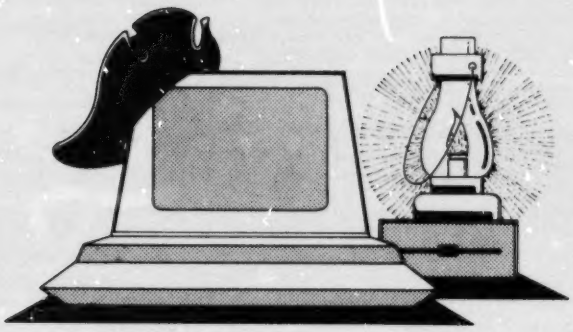
Given these potential problems, computer programs that permit stopping and starting offer much more flexibility. They can be used by individual students, small groups, or with a large class. With several options available, a teacher can maintain control over the learning process while having access to only one computer. When more computers are available, there are additional advantages. More students may use individual programs that require continuous interaction and the *down time* for other students will be less.

Using computers effectively requires careful thinking and planning.

- What type of computer application is needed?
- How can it be integrated into the total instructional sequence?
- How can the class be managed most effectively?

Each of these issues is important. However, it is critical that a computer application be selected *because it is useful in reaching a specified learning goal.* Computer applications can enhance the instructional process if used correctly. The computer is a powerful and stimulating piece of technology, but it cannot overcome poor instructional strategies. Developing these strategies is the job of the professional social studies teacher.

After considering these instructional issues and becoming familiar with some computer applications, where can computer programs for the social studies classroom be found? The next chapter provides some suggestions.



Chapter 5: Where Can Social Studies Computing Materials Be Found?

A few years ago only a handful of computer software developers were creating classroom materials. Today there are hundreds of companies, ranging in size from small cottage industries to major companies with *electronic publishing* divisions, developing computer learning materials. While social studies has not been a prime area of computer product growth, the number and quality of such materials will increase during the next few years. Major publishers are now beginning to complement their textbooks with computer-related materials, and smaller publishers are addressing this area as social studies teachers begin to demand more materials. This chapter provides information on where a teacher can look for appropriate computer materials.

Software directories, catalogs and professional journals can be used to locate computer materials. The list below provides an indication of what is available in each category but should not be considered an exhaustive listing of sources.

Software Directories

Software directories list the materials available from various publishers. Some provide descriptions of specific materials and reviews. Materials cannot be purchased through suppliers of the directories, however. Teachers must contact listed publishers directly. Directories range in price from about $5 to $50.

The 1984 Educational Software Preview Guide. This guide lists favorably reviewed instructional computer software for K-12 classroom use. It was developed by the Educational Software Evaluation Consortium, representing 27 organizations involved in computer education throughout North America. The guide is designed to assist educators in locating software for preview. The selection of titles is based on critical evaluations conducted by participating organizations and on discussion among representatives of those organizations, supplemented by references to reviews published in professional journals. The absence of a title from this list should not be interpreted as a negative judgment. Many excellent packages may not have been widely reviewed by the time of the forum. The preview guide may be ordered from:

ICCE — Preview Guide
University of Oregon
1787 Agate St.
Eugene, OR 97403-1923

The Addison-Wesley Book of Apple Computer Software. This directory describes and evaluates a variety of materials available for Apple computers. Quarterly updates are provided at additional cost. The book may be ordered from:

The Book Company
16720 Hawthorne Blvd.
Lawndale, CA 90260

Classroom Computer Learning Directory. Part A— *Directory of Educational Computing Resources* contains information on software and hardware resources, information sources, educational computing organizations, funding, etc. Part B—*Directory of New Educational Computer Software* (1983-84) lists over 1,200 educational software packages for elementary through high school. All have been released within the past year. The two directories may be ordered from:

Classroom Computer Learning
5615 West Cermak Road
Cicero, IL 60650

Educator's Handbook and Software Directory. This handbook lists various programs by subject area and grade level. The address is:

Vital Information, Inc.
7899 Mastin Drive
Overland Park, KS 66204

Sources for Courses. This annual directory contains over 900 programs for kindergarten though college levels. Materials are listed by title, topic, grade level and vendor. Descriptions allow

comparison of various programs. The directory may be ordered from:

TALMIS
115 North Oak Park Avenue
Oak Park, IL 60301

Swift's Directory of Educational Software. This directory divides the contents into those available from commercial and non-commercial publishers. Grade level and academic disciplines are major divisions. The address is:

Sterling Swift Publishing Co.
1600 Fortview Road
Austin, TX 78704

TESS: The Educational Software Selector. TESS lists over 4,200 educational software products and more than 400 suppliers in its 583 pages. Titles are indexed by curriculum area and by hardware system. Publisher entries include preview policies, warranty information, backup policy, suppliers and discount information. This resource may be ordered from:

EPIE Institute
Teachers College Press
P.O. Box 1540
Hagerstown, MD 21741

Software Catalogs

There are two general sources of catalogs that present materials in social studies. First, catalogs are available from agencies that act as clearinghouses for information and programs. Second, commercial publishers have catalogs for advertising their own products.

Clearinghouses and evaluation centers serve as centers for the distribution or evaluation of materials. The following centers can provide information about social studies materials.

CONDUIT is a clearinghouse that reviews and distributes software, and publishes a periodical entitled *Pipeline.* Although most of the materials are for higher education, some packages in the social sciences would be applicable for senior high school social studies.

CONDUIT
P.O. Box 388
Iowa City, IA 52244

EPIE (Educational Products Information Exchange) and *Consumers Union* have developed an agency to evaluate computer software in education. The organization publishes a newsletter and evaluations to subscribers for a fee. Additional information may be

received by writing:

EPIE
PO Box 620
Stony Brook, NY 11790

Microcomputer Software and Information for Teachers (MicroSIFT) serves as a center for descriptive and evaluative information on a wide variety of computer software. The center has developed an *Evaluator's Guide* to assist teachers. Information on obtaining MicroSIFT evaluations may be ordered from:

Northwest Regional Educational Laboratory
300 SW 6th Avenue
Portland, OR 97204

SOFTSWAP serves as a center for educators who have original programs to exchange for others. It also sells programs related to various discipline areas. Information about SOFTSWAP may be obtained by writing:

SOFTSWAP
San Mateo County Office of Education
333 Main Street
Redwood City, CA 94063

Commercial Publishers

It is impossible to list all publishers who are producing materials for social studies. Interested teachers should talk with representatives from publishers who visit schools and write commercial publishers asking for specific information. Most catalogs contain descriptions, support materials and costs for each product. Remember that information received from a publisher is designed to sell the product by presenting it in the best possible light.

Professional Journals

In 1980 there were just a handful of journals discussing computer applications in education. There are now scores of journals devoted to computing. Those listed below are just a sample of ones that speak to computing directly or are social studies journals that have occasional articles on computers and social studies.

Classroom Computer Learning
5615 West Cermak Road
Cicero, IL 60650

The Computing Teacher
University of Oregon
1787 Agate Street
Eugene, Oregon 97403-1923

Electronic Education
Suite 220
1311 Executive Center Drive
Tallahassee, FL 32301

Electronic Learning
902 Sylvan Avenue
Englewood Cliffs, NJ 07632

Professional organizations also publish journals that occasionally focus on computers in the classroom. There are general articles about using computers in most of the journals; however, *Social Education* and *The Social Studies* are specific journals devoted to social studies education. The National Council for the Social Studies, the publisher of *Social Education*, also has a special interest group on computing that meets at regional and national NCSS conferences.

Social Education
National Council for the Social Studies
3501 Newark Street, N.W.
Washington, D.C. 20016

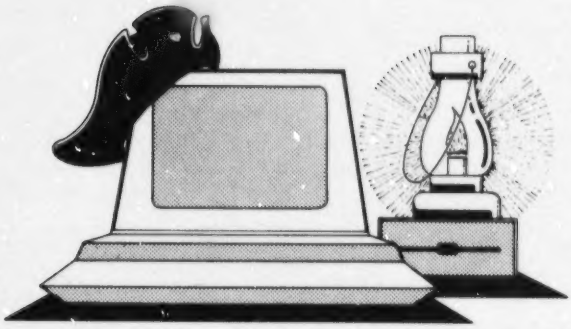
The Social Studies
Heldref Publications
4000 Albemarle Street, N.W.
Washington, D.C. 20016

Attending local, regional and national meetings is another excellent way to locate classroom-tested materials.

Before ordering any software, the following points should be considered:

- Does the company have a preview policy? A preview policy outlines the conditions for receiving a product for examination. If not, does the company have a return policy?
- Will the company provide an update of a newer version of the program at a minimal cost?
- Can you make backup copies? Does the company provide a backup diskette?
- If the product is expensive, does the company have a sound reputation in the field? Will the company be around long enough to provide help if needed?

Let's assume you have received a preview copy of a product. How can you tell if the software is worth purchasing for classroom use? This is the topic of the next chapter.



Chapter 6: How Are Educational Computing Materials Evaluated?

After locating appropriate computer- related social studies materials, make sure they receive the same careful evaluation that all social studies teaching materials should undergo prior to classroom use. Many of the criteria used to evaluate more traditional materials such as books and films can also be applied to computer materials.

Computing Materials Packages

What do "computing materials" include? Typically a diskette, which is inserted into the computer to produce an activity on the computer display screen. But the diskette is often only part of the materials. In addition to the student activities, some packages contain teacher support materials in book form. Such support materials might include grade/reading level information, learning objectives, background for the activities, reproducible student worksheets, transparency masters, sample lesson plans, and test materials.

Another package might include software and student workbooks. The student alternates between reading in the workbook, using the computer, and doing worksheets in the workbook. In other cases, the product might simply be a book. The teacher might use the book in studying the social impact of computer use without any hands-on computer activity. Computing materials in some cases look the same as other, more traditional, social studies materials.

Matching Materials to Your Computer

Before a software package is evaluated, make sure it is compatible with the school's computers. In time, this will become second nature. Consider these factors:

- *Brand of Computer.* Software designed for one brand of computer will not work on another. For instance, an Apple program will not run on a Commodore computer.
- *Model of Computer.* Software designed for one model of computer may not work on another model. A Radio Shack TRS-80 Model III program, for instance will not run on the Radio Shack TRS-80 Color Computer.
- *Type of Storage Device.* Software produced in diskette form (for use in a disk drive) won't work on a cassette tape player; cassette tapes won't work in a disk drive. Some programs need two disk drives.
- *Memory Capacity.* Software designed for a computer memory capacity of *48K* won't work on a computer with only a *32K* capacity.
- *Computer Language.* Software designed for use with the Pascal computer language won't work on a computer that handles only the BASIC language.

Don't let these technical items be intimidating! In many cases, a school owns only one brand of computer, and only one model of that brand (Apple II, for example). Also, most, if not all, of those computers will be configured in the same way—for example, disk drive storage, 48K memory, and BASIC language. If the school has designated a staff person to coordinate computer use, that person should be able to provide a list of available hardware.

Instructional Evaluation Criteria

Consider the product as a whole, including both computer software and written support or student material. This combination is often referred to as *courseware* to indicate that it is a complete instructional product. The most important factors in the evaluation process apply to the evaluation of any instructional product. If a courseware product is not instructionally sound, all the technical wizardry in the world will not make it valuable in the classroom.

Begin by reading courseware reviews obtained from sources listed in the previous chapter to see what criteria reviewers use, or take a moment to review the list of criteria that you now use

to evaluate social studies materials. Check your list against the one that follows.

- *Relevance.* Subject matter must fit the teacher's instructional objectives and learning plan.
- *Accuracy.* Subject matter must be accurate.
- *Reading level.* Reading level of the material (both in the written student materials and on the computer screen) must be appropriate for students in the class.
- *Length.* Learning activities must be an appropriate length, so that students have enough time to meet an objective without becoming tired of the work.
- *Sequence.* Learning activities must be sequenced in such a way that students can follow them clearly and are effectively guided toward the intended outcomes.
- *Instructions.* Both teacher and student instructions must be clear and concise.
- *Grammar.* Correct grammar, spelling and punctuation must be used.
- *Motivation.* Activities must be motivating to students. The design of the materials, including computer screen displays, should be attractive to students.
- *Reinforcement.* Appropriate methods must be used to reinforce both correct and incorrect responses during the activity. Correct responses should periodically receive a compliment. If motivating screen displays are used as reinforcement, they must be saved exclusively for correct responses so that no reward results from incorrect ones.
- *Acceptability.* The materials must be socially acceptable and avoid stereotypes and other forms of bias.
- *Completeness.* The product, particularly the teacher support materials, must contain all the information and materials necessary for effective use.
- *Cost.* Although cost is important, it should be considered after other instructional criteria have been assessed. A superlative instructional product that costs too much is unfortunate, however, an inexpensive product with serious instructional shortcomings is no bargain in the end and should not be purchased.

Computer-Related Evaluation Criteria

If the computer is used for a learning activity, it should be used well. The contents of a book can be displayed on the computer screen page by page, but nothing is gained for the expense.

The computer as an instructional delivery system has some unique characteristics not found in other media. A comprehensive evaluation should take these into account.

Most importantly, the computer is an *interactive* device. Computer activities should include a significant amount of interaction between student-entered information and computer responses. The computer can also produce random events and responses in an activity without rolling dice or drawing cards. It can enhance a presentation with specialized graphics displays or sound. The computer can also branch to respond differently to different student responses. Computer products worth purchasing usually take advantage of these features—not just for their own sake, but to increase the value of the student learning experience.

User control is another important factor that should be built into the design of a courseware product. Students should be able to proceed through a program at their own pace unless reading speed or response time is a factor in the activity. Some students read faster than others. Some students will want to think longer before responding. They should have control over movement from one screen display to the next.

Another aspect of control involves the material's flexibility in adapting to an individual learner's needs. It is helpful if the courseware allows teachers (or students) to tailor the level of difficulty or length of the activity. Such flexibility allows the product to be used with a wide variety of students, and increases its value in the classroom.

Another computer-related evaluation factor is how the program handles user *input*, or responses. The *output* displayed on the computer screen or printer can be judged much like written material in terms of layout, legibility, and use of graphics and color. Books, however, do not process student responses. The computer does. Evaluation of this aspect is therefore unique to computer materials.

As most computer activities are not typing tests, activities should be designed to require student responses that are easy to type in, perhaps just a single letter or number. Excessive typing requirements only decrease students' enthusiasm for the activity. The computer should gracefully handle unexpected responses such as an "A" typed in response to a list of choices marked 1, 2, 3 and 4. The courseware should be able to accept all types of nonsense input without breaking down. Instead, a message to the student saying "try again" should be generated. Even if the input is in the correct number or letter form, reasonable bounds

should be maintained by the computer. For example, if the student answers the question "how many questions would you like in this quiz" by typing "100,000", the courseware should be designed to respond with a message such as "try a more reasonable number like 20 or less."

The quality of a product's technical design is most obviously seen in the images that appear on the computer screen. However, more "hidden" design elements—the product's ability to anticipate all types of student input and respond in a manner that is friendly without interrupting the flow of the activity— must also be evaluated.

Evaluation Criteria for Product Support

The cost of a typical courseware product ranges from $40 to $100 or more. A school considering purchase of such a product will be concerned about several things. Can the product be previewed prior to purchase? Some publishers have local representatives who can demonstrate products for schools. Some products are distributed through local stores which might allow an in-store preview. Still other products come with an agreement that allows return of the product within a specified period if the buyer is not satisfied. It is just as important to preview computer products as it is to preview a new textbook prior to purchase.

What happens if the software fails after purchase? Diskettes can occasionally fail to work, sometimes for no apparent reason. Some publishers anticipate this possibility by supplying the buyer with a backup copy to use in case the first one fails. Others offer a lifetime trade-in so that failed products can be replaced. It is risky to purchase a product without such guarantees.

Can multiple copies of the software be purchased at a discount? If a product proves to be successful, a school might want to purchase several copies, especially if students work on the activities individually. If students are to use the software as a group, multiple copies are needed. Some publishers might offer a volume discount for purchase of class sets, while other publishers have no such provision. When evaluating the price of a product, keep in mind the number of copies you will need to use it effectively in the classroom.

An Evaluation Process

A school typically sets up a committee to evaluate new textbooks. Computing products can be handled in the same way. The evaluation of a courseware product takes more time than a book, because both written and computer materials are involved.

To divide the task, some committee members may evaluate the written material while others test the computer software.

Review of the software on the computer should include several trials. Run the activity through "correctly" to get a feel for what it contains. Then run through it as a student who does not follow directions well. Enter improper responses to see how the computer reacts. Since the activity may involve a branching process, several runs may be needed to test out the different options or choices involved. It is also helpful to have students try the product as part of the evaluation process. They will often question things that teachers overlook.

Several groups have developed evaluation forms and/or pamphlets on the evaluation process.

> The TECC/California Library Media Consortium for Classroom Evaluation of Microcomputer Courseware, "Checklist of Evaluative Criteria." Redwood City, CA, 1984.

This form was designed to be as short and simple as possible, and it does not include an explanation of the evaluation criteria. The form may be reproduced and modified to meet local needs. (Available from Ann Lathrop, SMERC Library and Microcomputer Center, San Mateo County Office of Education, 333 Main Street, Redwood City, CA 94063.)

> Heck Williams, Jerry Johnson & Robert Kansky, *Guidelines for Evaluating Computerized Instructional Materials*. Reston, Virginia: National Council of Teachers of Mathematics, 1981.

This booklet includes evaluation criteria and an evaluation form. The guidelines are not math specific and may be used effectively with courseware in any subject area. (Available from the National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091.)

> MicroSIFT, *The Evaluator's Guide for Microcomputer-Based Instructional Packages* (Fifth Printing). Eugene, Oregon: ICCE, 1984.

MicroSIFT has developed and thoroughly fieldtested this comprehensive evaluation document which contains evaluation criteria, a blank form, and sample evaluations. (Available from ICCE, University of Oregon, 1787 Agate St., Eugene, OR 97403-1923.)

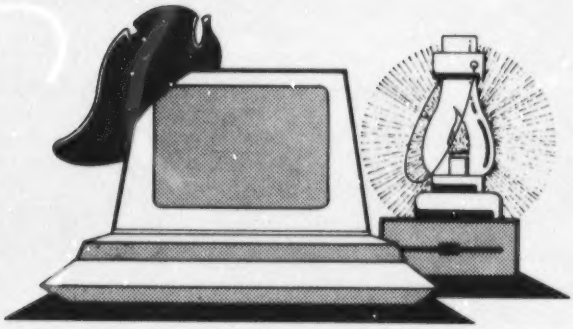
Making a Decision—Additional Considerations

After evaluators have reviewed the product and have judged it against a chosen set of criteria, that data must be used to make a decision on whether or not to purchase the product.

This decision, and the evaluation process that leads to it, should be kept in perspective. Consider these questions.

- *Are there alternatives to the product?* If only one package exists for a content area in which a computer program is desired, it might be approved for purchase simply if the quality and price of the product is acceptable. On the other hand, if there are several simulations on running a business suitable for use in an economics class, the evaluation must be more selective.
- *How much data should be collected in evaluating the product?* To answer this, consider how much data can be handled. It is probably unrealistic to expect five evaluators to complete a fifty-question checklist and then analyze the 250 data items generated. Most products can typically be evaluated adequately on about 20 factors. And in some cases, only one question may be necessary. For example, if a computer quiz on geography says the capital of Illinois is Chicago, the program would probably be rejected on "content accuracy" alone. Likewise, if a product perpetuates an undesirable stereotype, it could be rejected on that basis.
- *How much money is involved?* Every product deserves a reasonable evaluation, but it makes sense to spend more time on a product which costs $500 than on one which costs $50. The results of the evaluation must be worth the time and effort invested.

So far the focus has been on individual computing activities or products. The final chapter places these individual activities into the larger picture of the school's overall instructional program.



Chapter 7: How Does Computing in Social Studies Fit Into the School's Overall Instructional Program?

There are two general reasons to consider the use of computing in the social studies classroom. Improvements in social studies instruction are continually being developed, and use of the computer may improve or enhance instruction in some areas. In addition, it is generally believed that students will be better prepared to live in a technological world if they become familiar with technology while in school. Social studies teachers must be aware of how their efforts fit into the school's overall instructional computing plan. At least some social studies computing activities should tie into computing activities in other parts of the curriculum. This can be considered in several ways.

Social Studies as a Subject Area

Curricula are usually made up of subject areas of which social studies is one. Each subject area is guided by a set of goals and objectives which specify the knowledge, skills and attitudes to be learned by students. Schools that have a goal of generally improving instruction through use of technology will want to include social studies as part of the plan.

It is important to analyze the social studies curriculum and the available computer applications to see where and how they fit together. If the curriculum contains an objective that says

students should know about the events surrounding the War Between the States, then a computer activity simulating Civil War battles might be used. If there is an objective which addresses students' ability to draw conclusions from data, a computer activity in which survey data is analyzed can effectively be used in meeting this objective. If an objective calls for students to develop an attitude of desiring to cooperate with others, a simulation of running a business with a group of partners can be used. Note that the curriculum is not determined by available computer activities or programs, but rather, *computer activities are selected to fit the aims of the social studies curriculum.*

It is important to think about the usefulness of computer activities in the broadest context. The computer courseware product that is valuable in the social studies classroom may not always be titled "Social Studies." A word processing package can help students write better social studies reports. A data- analysis package can result in students learning social studies vocabulary. If the curriculum is the starting point, useful computing activities or programs can be selected—no matter what label appears on the box!

Social Studies' Contribution to General Skills Development

Another way to view the role of computing activities in social studies is to identify them as part of the development of skills that cut across subject areas. Computing in social studies can contribute to some of the global goals a school sets for its students.

Consider, for example, the skill of recognizing patterns and using them to make predictions about future occurrences. In more sophisticated forms this might include the process of creating and testing hypotheses. The development of this skill begins in the earliest grades, where students are shown patterns of shape and color and asked to predict how new items will fit into the pattern. In some cases, computer activities can be used in such an activity. This leads to certain mathematical concepts as students discover properties of numbers and geometric shapes. The development of this skill is then continued in social studies as students develop predictions based on observing social phenomena. In a computer simulation of running a business, maximizing profits depends upon identifying trends that link pricing, production and sales. In a simulation of an historical journey, students must learn from past mistakes in order to make decisions that will ensure successful completion of the trip. Winning a simulated political election depends upon predicting what kind of candidate behavior will generate support at the polls. In

these activities the computer is not used simply for its own sake or because it applies specifically to social studies. Its use is part of a larger instructional strategy.

Consider now the skill of being able to get along and work productively with other people. This aspect of socialization can also be encouraged through computer activities in social studies. Group problem solving in a simulated environment encourages students to work together to reach a common goal. Through a complex activity that otherwise would not be possible, the computer provides the opportunity for cooperation and group decision-making—a benefit that should be recognized in addition to the more obvious content delivery. Here, also, the computer is not just a tool for social studies learning. It facilitates the development of general social skills.

Social Studies' Contribution to Computer Literacy

The main technology-related goal for many schools is to give students a broad understanding of technology that will be useful to them as general citizens. When related to computing, this understanding is often referred to as "computer literacy." Schools planning for computer use must address two questions. What is computer literacy? How can it be implemented? These questions will be discussed along with their relationship to social studies.

Many people have offered a definition for computer literacy. Some see computer literacy as involving just the technical aspects of computing. Others say the technical side is really computer science and that computer literacy relates more to the social impact of computer use. If computer literacy is linked with preparing students for their adult life, and if every community has its own ideas about what should be contained in preparation for adulthood, perhaps every school or school district will devise its own definition of computer literacy.

Unfortunately, some people base their definition on a list of computing topics. What topics relate to computers? Computers can be operated. Computers can be programmed. People use computers in their jobs. Computers have a history, from primitive counting devices up through modern microcomputers. Computer use has generated a new set of vocabulary. The conclusion, then, is that computer literacy must include the study of computer operation, computer programming, computer careers, the history of computers, and computer terminology.

This approach does not make sense for education. The computer is a means to an end. The "end" is the list of attributes we desire in

citizens. Our definition of computer literacy should be based on student outcomes, not computer characteristics.

Again, every community has its own idea of what those outcomes should be. Here are some possibilities:

- *We want students to understand the world around them, especially those aspects of society, such as technology, that have a critical impact on the life of the individual.*
- *We want students to be self-sufficient users of technology so that receiving the benefits of technology is not totally dependent upon the actions of others. Control of technology means power in society, and we want that control dispersed throughout the citizenry.*
- *We want students to understand that humans can and do control technology, and not vice-versa.*
- *We want students to be unintimidated by technology, to feel comfortable using it without being inhibited by the details of its design and manufacture.*
- *We want students to understand that technology has drawbacks as well as benefits, and that if the use of technology is not subjected to ethical principles, it may harm instead of help people.*

Given this set of possible desired outcomes, what content should be included in a school's computer literacy plan? If students are to understand the place of computing in society, they should learn how computers are used. If students are to be self-sufficient computer users, they should learn how to operate a simple personal computer. If students are to understand who is in control, they should have experience controlling computers such as computer programming or other activities in which the computer responds to directions from the student. If students are to be unintimidated by computers, they need to learn something about how computers work and that they are simply machines performing a series of tasks. If students are to be aware of technology-related problems, they should learn about the impact of computers on society.

The above represents five examples that follow from a sample list of desired student outcomes. Educators can develop their own set of outcomes, which may suggest a different list of components for computer literacy. The above examples can be summarized as follows:

Components of Computer Literacy

How Computers Are Used in Society
How Computers Are Operated
How Computers Are Instructed
How Computers Work
How Computers Inpact on Society

Now, how can such a definition be implemented in a school curriculum? Many educators have suggested a computer literacy course, where all of the above topics can be briefly covered, perhaps in a single nine-week course for seventh graders. But wait. Look again at the above list. Who on the school staff can most appropriatly cover each topic? The "computer teacher" might cover how computers are instructed, since computer programming is an obvious way to show this. However, language arts teachers might also contribute if word processing is also used. Science teachers might easily cover how computers work, while business or industrial arts teachers cover how computers are operated.

Two topics on the list are left. Who should teach how computers are used and their impact on society? These areas relate to study of our society—the very heart of the social studies.

This suggests that students' computer literacy could be developed as a gradual process. It could be the cumulative effect of a series of learning activities which cut across grade levels and subject areas. Computer literacy, like the skill of hypothesizing, can be developed over time within the curriculum.

This approach gives many teachers, including those in social studies, a stake in developing computer literate students. It emphasizes that computer use is not an isolated event but one that is integrated into the curriculum. It provides a connection between subject areas that helps students see their schooling as more than a random collection of classes.

As computing becomes more integrated into the social studies classroom, two goals—one old and one new—will be accomplished. Instruction in the knowledge, skills and attitudes deemed as important by social studies educators will improve. In addition, students will become better prepared for a life which will be heavily influenced by existing technologies and technologies yet to come.

Future Needs

This book has attempted to provide suggestions on why computers should be used in social studies instruction, how computing fits into what social studies teachers do, and how social studies activities can be implemented in the classroom. Although teachers still find themselves in a situation where it is not convenient to make significant use of computers, *all* teachers owe it to themselves as professionals to experiment with computers enough to understand their potential for use. Three key resource needs must be met to go beyond the experimentation stage.

More Computers. Computers must be readily available if teachers are to use them effectively. This is primarily an economic question which each school must solve. Computer equipment prices have decreased, but not all inexpensive computers offer educators the kind of support needed for successful classroom implementation. In general, the cost of computing equipment can be reasonable if it is viewed as a school-wide resource that benefits the whole staff. In this way, no one group receives a disproportionate amount of a school's limited resources.

More Courseware. Subject areas and grade levels currently suffer from an inadequate supply of high quality courseware. This is not surprising considering the breadth of a school's curriculum and the short time (about five years) that courseware production has been taking place. In the social studies area, these materials are especially needed:

- *Drill packages covering comprehensive content areas which also allow teachers to enter their own content, and which include a detailed record-keeping system for tracking student progress.*
- *Simulations in a variety of topics which lead students to ask analytical questions and seek answers through participating in life-like experiences.*
- *Easy-to-use information analysis packages that allow students to explore the contents of data collections or to retrieve selective information on topics they are studying. Computers will be key elements of libraries and information catalogs of the future; students need to be prepared today to use these resources.*
- *Activities which demonstrate how computers are used in society and the social issues created by use of technology.*

Publishers are cautious in creating new kinds of products because of the substantial financial investment that goes into the development process. Social studies teachers must find organized ways to make publishers aware of the demand that could exist

for the right kinds of new applications.

More Training. Introductory teacher training in instructional computing often focuses on the operation of the computer itself with an overview of available computer applications. As more teachers move past this stage, indepth training will be needed. This training should concentrate on the use of computers in specific subject areas like social studies, and should include the following topics:

- Integrating computing into the curriculum
- Matching computing activities to learning objectives
- Planning an instructional sequence that includes computing activities
- Developing teaching techniques for classroom computer use
- Using specific computing applications
- Evaluating computer courseware
- Evaluating student progress in computer activities

One thing is clear. The school that is committed to using computers effectively must put appropriate resources behind that decision. Without proper training and availability of equipment and materials, teachers will have great difficulty using computers in ways that make a difference in instruction. At the same time, teachers should make every effort to take advantage of the opportunity afforded when a school does make a supported commitment to implement instructional computing.

Computers are and will be changing our society. The social studies teacher has a special role to help students understand, adjust to and prepare for those changes. The message that social studies teachers should become involved in computer use is perhaps as urgent today as Paul Revere's message was two hundred years ago.

ICCE Organization Members

U.S.

Alabama

Alabama Council for Computer Education
Contact: Robert H. Beach, President
P.O. Box 6015, Dothan, AL 36302

Alaska

Alaska Association for Computers in Education (AACE)
Contact: Sandra Burgess
Coordinator, The Northern Institute, 650 W. International Airport Rd., Anchorage, AK 99502

Arizona

Arizona Computer Users in Education
Contact: Nancy Watson
2148 Sanos Drive, Tempe, AZ 85281

California

Computer-Using Educators (California)
Contact: Glenn Fisher
Alameda County Office of Education, School Computer Unit, 224 W. Winston Ave., Hayward, CA 94544-1198

Florida

Florida Association of Science Teachers (FAST)
Contact: Richard Swetsir
3147 Scotten Rd., Jacksonville, FL 32205

Idaho

Computer Educators of Idaho
Contact: Dennis Dempsey
P.O. Box 1088, Hailey, ID 83333

Illinois

Illinois Association for Educational Data Systems (ILAEDS)
Contact: Lyle B. Smith, President
Computer Science Dept., Northern Illinois University, Box 128, De Kalb, IL 60115

Indiana

Indiana Computer Educators
Contact: David A. Flowers
Ft. Wayne Community Schools, Adm. Ctr.
1230 So. Clinton St., Ft. Wayne, IN 46802

Kentucky

Computer-Using Educators of Kentucky (CUE-KY)
Contact: Janet Parker
EMCE Dept., School of Education, University of Louisville, Louisville, KY 40292

Michigan

Michigan Association for Computer Users in Learning (MACUL)
Contact: Lary R. Smith, Communications Sect., 33500 Van Born Road, Wayne, MI 48184

Minnesota

Minnesota Association for Educational Data Systems
Contact: Bill Bjorum
1875 S. Greeley, Stillman, MN 55082

Montana

Montana Council for Computers in Education
Contact: Leon Roland
1846 Bitteroot
Billings, MT 59105

New Hampshire

New Hampshire Association for Computer Education Statewide (NHACES)
Contact: Anne Knight, President
University of New Hampshire, Computer Services, Durham, NH 03824

New Jersey

Computers, Learners, Users, Educators Association (CLUES)
Contact: Henry J. Petersen, Executive Director
50 Nellis Drive, Wayne, NJ 07470

New Mexico

New Mexico Council of Computer Users in Education
Contact: Dr. Phil H. Burch, President
P.O. Drawer 90, Los Alamos, NM 87544

New York

Educational Microcomputer Users Group of Central New York (EMUGCNY)
Contact: Jane McCrohan
Rosboro Middle School, Marrydale, NY 13211

National Institute for Microcomputer Based Learning (NIMBL)
Contact: Stanley Silverman, President
348 Plymouth Ave., Brightwaters, NY 11718

New York State Association for Educational Data Systems
Contact: Don Ross, President
Ardsley High School, 300 Farm Road, Ardsley, NY 10502

Ohio

Educational Computer Consortium of Ohio
Contact: Alice Fredman, Director
4777 Farnhurst Road, Cleveland, OH 44124

Oklahoma

Oklahoma Educational Computer Users Program (OECUP)
Contact: Richard V. Andree
Dept. of Mathematics, 601 Elm St., 4423, University of Oklahoma, Norman, OK 73019

Oregon, Washington, Northern Idaho

Northwest Council for Computer Education (Oregon, Washington and Northern Idaho)
Contact: Howard Bailey
Computing Center, Eastern Oregon State College, La Grande, OR 97850

Pennsylvania

Pennsylvania Learning Resources Association (PLRA)
Contact: George H. Zook, Director, IMS
Lancaster-Lebanon I.U. #13, P.O. Box 5026, Lancaster, PA 17601

Texas

Texas Computer Education Association
Contact: Vicki S. Smith
P.O. Box 2573, Austin, TX 78768

Utah

The Utah Council for Computers in Education
Contact: Dr. Larry C. Christensen
1295 North 1200 West, Mapleton, UT 84663

Wisconsin

Milwaukee Educational Computing Association
Contact: Henry Kepner, Jr.
Dept. of Curriculum & Instruction, University of Wisconsin—Milwaukee, P.O. Box 413, Milwaukee, WI 53201

Wyoming

Wyoming Educational Computing Council
Contact: Robert L. Morissette, President
Laramie County School District #1, Admin. Bldg., 2810 House Ave., Cheyenne, WY 82001

NON-STATE-AFFILIATED

Association for the Development of Computer-Based Instructional Systems (ADCIS)
Contact: Dr. Gordon Hayes, Executive Director
ADCIS—Miller Hall 409, Western Washington University, Bellingham, WA 98225

Society of Data Educators (SDE)
Contact: Robert Behling
Bryant College, Smithfield, RI 02917

AUSTRALIA

New South Wales

New South Wales Computer Education Group
Contact: Toni Downes, Chairperson
P.O. Box 148, Broadway, N.S.W. 2007
Australia

Queensland

Computer Education Group of Queensland
Contact: D.A. Carey
G.P.O. Box 1669, Brisbane, Queensland 4001
Australia

Victoria

Computer Education Group of Victoria
Contact: Leon Gurs, Conference Secretary
P.O. Box 245, Niddrie 3042
Melbourne, Victoria, Australia

Western Australia

Educational Computing Association of Western Australia
Contact: Mr. K. Penter
c/o Schools Computing, Education Dept., 151 Royal St., East Perth, Western Australia

CANADA

Alberta

Alberta Association for Educational Data Systems
Contact: Keath Austen
838 Education Tower, University of Calgary, 2500 University Dr. NW, Calgary, Alberta, Canada T2N 1N4

British Columbia

Computer-Using Educators of British Columbia (CUEBC)
Contact: Barry Underwood
509 Alder St., Campbell River, B.C., Canada V9W 2N9

Ontario

Educational Computing Organization of Ontario (ECOO)
Contact: Robert E. Drake, President
252 Bloor Street West, Toronto, Ontario, Canada M5S 1V6

The Science Teachers' Association of Ontario
Contact: Warren Sirrs
1032 Harkness Ave., Ottawa, Ontario, Canada K1V 6P2

Manitoba

Manitoba Association for Educational Data Systems (MAN-AEDS)
Contact: John Muller
27 O'Brien Crescent
Winnipeg, Manitoba, Canada R3R 1M5

Quebec

Quebec Association of Computer Users in Education
Contact: Don Rosenbaum, Membership Director
P.O. Box 369, Ormstown, Quebec, J0S 1K0, Canada

Saskatchewan

Saskatchewan Association for Computers in Education
Contact: Duncan Campbell
Mt. Royal Collegiate, 2220 Rusholme Road, Saskatoon, Saskatchewan, Canada S7H 4A4

IRELAND

Computer Education Society of Ireland
Contact: Mary Devlin
85 Limetrees Road East, Douglas, Cork, Ireland

ISRAEL

Computer-Using Educators SIG of the Israeli Data Processing Association
Contact: Dr. Hira Nativa, School of Education, Sharet Building, Tel Aviv University, Tel Aviv 69978, Israel

JAPAN

Society for Microcomputers in Life & Education
Contact: Hillel Weintraub, Acting President
Doshisha International High School, Tatara, Tanabe-cho, Tsuzuki-gun, Kyoto-fu, Japan 610-03

NETHERLANDS

DIDACOM
Contact: H. van Zijl
Sierremos 4, 3089 AS Rotterdam, Holland

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